CLAIMS

1. Time synchronizing device (1) for synchronizing a router (10)
arranged between two communication networks (4, 5), said synchronizing
device (1) comprising:
- receiving means (11) for receiving synchronizing data (SYNC)
based on a reference time clock (CL1-CLn),
- and exploiting means (12) for exploiting said synchronizing
data (SYNC) so as to synchronize a local time clock (CL0) used by said
router (10) with respect to said reference time clock (10),

characterized in that said time synchronizing device (1)
comprises:
- intercepting means (13) for intercepting at least one message
(MSG) coming from at least one apparatus (A1-An) being a point of at least
one of said networks (4), called the source network for said message (MSG),
and directed to the other of said networks (5), called the target network for
said message (MSG), said apparatus (A1-An) having a specific time clock
(CL1-CLn),
- preparing means (14) for preparing a time request (RQ)
intended for said apparatus (A1-An), said time request being able to be
executed in said apparatus so as to cause said synchronizing data (SYNC)
based on said specific time clock (CL1-CLn) to be obtained from said
apparatus (A1-An) and to be transmitted back to said synchronizing device
(1),
- sending means (15) for sending said time request (RQ) to said
apparatus (A1-An),
- and forwarding means (16) for forwarding said intercepted
message (MSG) to said target network (5) after the preparing means (14)
have prepared said time request (RQ),

said receiving means (11) being intended to receive said synchronizing data (SYNC) from said apparatus (A1-An) and said exploiting means (12) being able to exploit said synchronizing data (SYNC) so as to synchronize said local time clock (CL0) with respect to said specific time

5   clock (CL1-CLn), said receiving means (11), exploiting means (12), intercepting means (13), preparing means (14), sending means (15) and forwarding means (16) forming an operational set (20).

2. Synchronizing device (1) according to claim 1, characterized in

10   that said intercepting means (13) are intended to intercept said message (MSG) and said receiving means (11) are intended to receive and extract said synchronizing data (SYNC) in compliance with the HTTP protocol.

3. Synchronizing device (1) according to claims 1 or 2,

15   characterized in that said preparing means (14) are intended to prepare the time requests (RQ) in the form of executable scripts, preferably based on the Java language.

4. Synchronizing device (1) according to any of claims 1 to 3,

20   characterized in that said forwarding means (16) are intended to forward said intercepted message (MSG) to said target network (5) only after the exploiting means (12) have exploited said synchronizing data (SYNC) obtained from said apparatus (A1-An) by means of said time request (RQ).

25   5. Synchronizing device (1) according to any of the preceding claims, characterized in that said preparing means (14) are able to prepare said time request (RQ) for getting at least one of the following synchronizing data (SYNC): time zone and daylight saving time information.

30   6. Synchronizing device (1) according to any of the preceding claims, characterized in that it comprises updating means (17) for

periodically updating said synchronizing data (SYNC) so as to synchronize said local time clock (CL0), by periodically activating said operational set (20), said updating means (17) being preferably intended for using as said intercepted message (MSG) for each of said updating periods, the first

5   message received from at least one of said communication networks (4, 5) during said period.

7. Synchronizing device (1) according to any of the preceding claims, characterized in that it comprises safety means (18) able to activate

10   said operational set (20) for at least two successive messages (MSG) from respectively at least two different apparatus (A1-An), to compare said synchronizing data (SYNC) respectively obtained for said successive messages, to check consistency of said synchronizing data (SYNC) and to trigger a warning mechanism in case of inconsistency.

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8. Local gateway (10) intended to be arranged between a LAN (4) and a WAN (5) and to enable communication in both directions between the LAN (4) and the WAN (5), said local gateway comprising:

- a LAN-interface (2) for communication with the LAN (4),

20   - a WAN interface (3) for communication with the WAN (5),

- a local gateway time clock (CL0),

- and synchronizing means for synchronizing said local gateway time clock (CL0) with respect to a reference time clock (CL1-CLn), by means of synchronizing data (SYNC) received by said local gateway (10),

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characterized in that said synchronizing means comprise a time synchronizing device (1) compliant with any of claims 1 to 7 for synchronizing said local gateway (10), said source and target networks being respectively the LAN (4) and the WAN (5) for all intercepted messages

30   (MSG), and said apparatus (A1-An) used for synchronizing being thus at least one point of said LAN.

9. Local gateway (10) according to claim 8, characterized in that said synchronizing means are also able to synchronize said local gateway time clock (CL0) with respect to a global time clock (GCL) available from a

5   timeserver (8) of the WAN (5).

10. Process for time synchronizing a router (10) arranged between two communication networks (4, 5), said time synchronizing process comprising the following steps:

10   - receiving (S5) synchronizing data (SYNC) based on a reference time clock (CL1-CLn),

        - and exploiting (S6) said synchronizing data (SYNC) so as to synchronize a local time clock (CL0) used by said router (10) with respect to said reference time clock (10),

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        characterized in that said time synchronizing process also comprises the following steps:

        - intercepting (S3) at least one message (MSG) coming from at least one apparatus (A1-An) being a point of at least one of said networks

20   (4), called the source network for said message (MSG), and directed to the other of said networks (5), called the target network for said message (MSG), said apparatus (A1-An) having a specific time clock (CL1-CLn),

        - preparing a time request (RQ) intended for said apparatus (A1-An), said time request being able to be executed in said apparatus so as to

25   cause said synchronizing data (SYNC) based on said specific time clock (CL1-CLn) to be obtained back from said apparatus (A1-An),

        - sending (S4) said time request (RQ) to said apparatus (A1-An),

        - and forwarding (S7) said intercepted message (MSG) to said target network (5) after said time request (RQ) has been prepared,

30   said receiving step (S2) including receiving said synchronizing data (SYNC) from said apparatus (A1-An) and said exploiting step (S6)

including exploiting said synchronizing data (SYNC) so as to synchronize said local time clock (CL0) with respect to said specific time clock (CL1-CLn),

5   said time synchronizing process being preferably intended to be executed by means of a time synchronizing device (1) compliant with any of claims 1 to 7.

        11. Computer program product comprising program code
10   instructions for the execution of the process according to claim 10 when said program is executed on a computer.